

AMENDMENTS TO THE CLAIMS

1. **(Currently Amended):** A method for preparing a hydrogen generation reactor chamber to reduce coking, the method comprising:

applying a cold spray of an alkaline oxide or oxides doped with alkali or alkaline earth metals, mixed with metal to at least one surface within the chamber; and

~~depositing a catalyst on a support structure in the reactor chamber, the support structure comprising at least one of metal foams, ceramic monoliths, foams, or mesochannels.~~

2. **(Original):** The method of claim 1 wherein the metal is selected from the group consisting of noble metals and alkaline metals.

3. **(Original):** The method of claim 1 wherein the percentage of metal to alkaline oxide in the cold spray is about 50% to about 90%, respectively.

4. **(Original):** The method of claim 1 wherein said hydrogen generation reactor chamber is comprised of at least one of aluminum, stainless steel, titanium and high temperature refractory alloys suitable for hydrogen generation.

5. **(Original):** The method of claim 1 wherein said hydrogen generation reactor chamber is further comprised of at least one port having a tube.

6. **(Previously Presented):** The method of claim 5 further comprising a step of applying a cold spray of an alkaline oxide or oxides doped with alkali metal or alkaline earth metals, mixed with metal to a surface of said tube, said application to said tube occurring either during said application of said cold spray to principal surfaces within the chamber or during a separate applying step.

7. **(Original):** The method of claim 6 wherein said applying step is directed to at least an inner surface of said tube.

8. **(Original):** The method of claim 6 wherein said applying step is directed to at least an outer surface of said tube.

9. **(Original):** The method of claim 6 wherein said tube protrudes into said hydrogen generation reactor chamber.

10. **(Canceled).**

11. **(Original):** The method of claim 1 wherein said hydrogen generation reactor chamber has a cover, said cover having applied thereto a cold spray of an alkaline oxide mixed with small quantity of metal.

12. **(Original):** The method of claim 11 wherein said cover also has a hydrogen separation membrane incorporated therein.

13. **(Original):** The method of claim 10, wherein said mesochannels have a width of about 0.3 mm to 2.5 mm.

14. **(Original):** The method of claim 10, wherein said mesochannels have a width of about the 0.5 mm to about 2.0 mm.

15. **(Original):** The method of claim 1, wherein said cold spray is applied to leave portions of said hydrogen generation reactor chamber uncoated for joining operations.

16. **(Previously Presented):** The method of claim 15, wherein said joining operations comprise at least one of welding, brazing or diffusion bonding.

17. **(Original):** The method of claim 1, further comprising applying said cold spray to any protrusion into said hydrogen generation reactor chamber.

18. **(Original):** The method of claim 17, wherein said protrusions is at least one of tubings, thermowells and wells for sensor probes.

19. (Canceled).

20. (Canceled).

21. (Original): The method of claim 1 wherein said hydrogen generation reactor chamber is tubular.

22. (Original): The method of claim 21 wherein said tubular hydrogen generation reactor chamber has covers or end-caps that contain one or more tubes.

23. (New): A method of fabricating a low temperature hydrogen generation reactor chamber for reduced carbon accumulation, the method comprising:

applying a cold spray of a mixture of metal and an alkaline oxide doped with alkali or alkaline earth metal to at least one surface within the chamber.

24. (New): A method of preparing a hydrogen generation reactor chamber to reduce carbon formation on an inner surface of the hydrogen generation reactor chamber, the method comprising:

applying a cold spray of an alkaline oxide, doped with alkali or alkaline earth metal and mixed with metal, to the inner surface of the hydrogen generation reactor chamber.

25. (New): A method of preparing a low temperature hydrogen generation reactor chamber to reduce carbon formation on an inner surface of the hydrogen generation reactor chamber, the method comprising:

spraying a gas-fill mixture, comprising a metal and an alkaline oxide doped with alkali or alkaline earth metal, to the inner surface of the hydrogen generation reactor chamber.